

Air Quality

Introduction

Air quality is an important consideration for Wasatch Front residents' quality of life and protection of GSL ecosystem. Air quality degradation has the potential to impair the aesthetic values of this viewshed (sunsets, open spaces). Planners and resource managers have recognized the importance of air quality and pollutant transport along the Wasatch. This section addresses air quality issues and regulations relating to management of the GSL system.

The planning team identified the following resource concerns:

- **Air quality impacts on trust resources are not well understood.**
- **Coordination to protect trust resources is a concern.**

Air Quality Studies

The *GSL Air Basin Wind Study* was conducted by the Wasatch Front Regional Council (WFRC) in 1980 to determine the characteristics of regional wind circulation and its effect on pollution dispersion and transport. This information was combined with results from previous wind studies in developing an air basin concept for air circulation, considering air quality impacts to individual communities and area-wide concentrations along the Wasatch Front. The transport of toxic substances, radiological materials, odor, sound propagation and wind energy were other environmental considerations (WFRC, 1980).

This study concluded that the transport and diffusion of pollutants are severely limited during inversions. Also, pollutants emitted into the lower layers of the atmosphere are not usually dispersed on a daily basis and depend on large-scale weather mechanisms that are much stronger than the diurnal circulation patterns.

This study also developed recommendations for future industrial sites and the transport of toxic substances. The confining terrain, diurnal wind circulation and high inversion frequency requires that industrial sites be very carefully considered in this air basin. The impact of a given industry will depend on the transport properties of its emissions and the dispersion characteristic of the locality. This study also recommended that the use, storage and transport of toxic chemical, biological or radiological substances be carefully monitored since toxicity, dilution and other factors could be distributed easily resulting in a "critical transportation zone." Odors from industrial releases, sewage treatment facilities, wetland areas and decaying organic material in the lake are also easily transported. This study suggested that additional research be conducted on pollutants and their spatial and temporal emissions and completion of an inventory expanding on the existing database and sampling programs. This would include mixing heights and determining if an ozone cell exists to improve understanding of physical air quality systems in this basin (WFRC, 1980).

Existing Regulations

The *Clean Air Act Amendments of 1990* provide the policies regarding areas not currently meeting federal health standards for certain criteria pollutants. They also require that comprehensive state air quality plans be developed that will reduce pollutant concentrations to a safe level. The maximum allowable concentrations set by EPA for the criteria pollutants are known as the National Ambient Air Quality Standards (NAAQS). Areas failing to comply with these standards are considered nonattainment areas and can be classified as marginal, moderate, serious, severe or extreme. An area with a marginal rating will have less time to reach attainment than an extreme classification. Currently, Utah has, or is in the process of writing State Implementation Plans (SIPS) for several nonattainment areas; these include Davis, Salt Lake, Utah and Weber Counties. These counties are nonattainment areas for any single or combination of these pollutants:

- Particulate matter (PM10)
- Sulfur dioxide (SO₂)
- Ozone (O₃)

Each state is responsible for developing plans to demonstrate how those standards will be achieved, maintained and enforced to protect public health, according to the *Clean Air Act* (42 U.S.C. Section 7401) requirements. These requirements set limits for maximum levels of pollutants in outdoor air. The SIPs and associated rules are enforced by the state and are subject to federal approval and compliance. These plans break down specific emission contributions from vehicles, industrial sources and human activities and also

provide the framework for each state's program to protect air quality.

Portions of Davis, Salt Lake, Tooele, Utah and Weber Counties have exceeded the health standards for the pollutants CO, O₃, PM10 and SO₂ and Salt Lake, Ogden and Provo/Orem cities are nonattainment areas for carbon monoxide (CO) as shown by air monitoring station data and analysis. Once air quality compliance is accomplished, the implementation plan remains in effect and a maintenance plan is prepared to demonstrate how air quality will be maintained for at least the next 20 years.

Air Quality Monitoring

Twenty-five monitoring stations are strategically located across the Wasatch Front and collect representative data to determine how much of each pollutant is in the air. Air pollutant concentration models are used to assess area pollution levels and provide information for maintaining air quality standards (DEQ, 1999).

DAQ has studied smog and other aspects of air quality for over 30 years. Regional efforts are underway for visibility concerns. National air quality standards are based on human health. There is a considerable level of protection figured into these standards and should simultaneously address wildlife health impacts from an air quality perspective (not a food chain perspective).

DAQ has operated monitoring stations at Magna since 1969 and on the south shore beach since 1981. In 1995, 363 days out of 365 days, SO₂ concentrations were less than 0.04 ppm at Grantsville. A similar level of pollution was recorded for Grantsville over a four-year period.

Due to the 1983-84 flood, the beach monitoring station was relocated south of the freeway overpass near 2100 south. In response to public comments and pollution incident reports, DAQ relocated the monitoring station to GSL Marina (GSLM) three years ago. There has been only one notable accidental release from ruptured duct pipes at KUC. DAQ believes that episodic downwash conditions from the Oquirrh Mountains might contribute to air quality near GSL. DAQ has used a three-hour SO₂ monitoring standard to address this issue. EPA is currently investigating a five-minute standard for SO₂ monitoring standard to address this issue.

Air Quality Concerns

Ozone Formation

Light interacting with chlorine leads to the formation of unstable molecules that can enhance environmental conditions for ozone formation when catalysts are present. Two studies have been completed examining the effects of chlorine emissions (Hov, 1985 and Whitten, Johnson and Killus, 1982).

Chlorine Emissions

Magcorp operates a facility located approximately 60 miles from Salt Lake City on the west side of GSL. This facility emitted about 44,300 tons of chlorine and 440 tons of hydrochloric acid during 1988. However, Magcorp has significantly reduced chlorine emissions over the last ten years and has submitted a notice of intent to install new technology which is expected to reduce emissions by over 95 percent by 2003. An approval order would include monitoring requirements to document reductions and permit compliance. There

has been a complete and thorough regulatory net to protect air quality and to dramatically reduce emissions. Stack testing, monitoring stations, health studies, dispersion studies and modeling, ozone and pollution studies have generated a massive amount of data indicating that there is no significant impact to the lake and wildlife.

Dioxin

Dioxin can cause a problem for the environment and wildlife, and DAQ is following up on these concerns. Approximately 19 months ago (November 1998) dioxin was identified in soil samples taken from Magcorp's wastewater ditch and ponds (DEQ, 1998). Dioxin levels in GSL near the waste ponds have been found to be within background levels. Dioxin is restricted to the wastewater ditch, scrubber discharge and from the stack at levels similar to municipal incinerator levels. Under DAQ oversight, Magcorp determined the likely process sources of dioxin and investigated the possible vectors by which dioxin contamination could leave the plant. DAQ did not find any dioxin in any of Magcorp's commercial products and test data confirm that there has been no significant contamination of the lake or the species of the lake. Dioxin levels in sediments from GSL near the plant are less than 50 parts per trillion (ppt), which is the generally agreed upon threshold that would require additional studies. Background levels of dioxin are also present in most soils due to industrial operations, incinerators and diesel engines.

Air Quality and Great Salt Lake Management

Air pollution along the Wasatch Front impacts visibility and GSL. Vehicles, industry and other air emissions are monitored. SIPs and other enforcement measures improve air quality conditions.

Air quality relates to management of the lake when trust resources are at risk or require protection. DEQ is currently (Spring 2000) coordinating with DNR and other state agencies. If contaminants are entering the lake and impacting wildlife or other trust resources, DNR would be interested in actively coordinating with DEQ and other agencies.

Air Quality Monitoring

DAQ will continue monitoring efforts and coordination with DNR. DAQ has considered installing an additional air quality monitoring station pending DNR and DPR approval on the south end of AISP when it becomes a little more developed. This would require an MOU. DAQ also suggested signs located at AISP and GSL Marina to provide a point of contact for air pollution incident reporting when air quality is poor. DAQ suggested that DPR could also help identify conditions that contribute to the problem by logging weather and air pollution information.